Reference (a)

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
19 April 2001 (19.04.2001)

PCT

(10) International Publication Number
WO 01/28146 A1

(51) International Patent Classification[7]: H04J 3/06, H04B 1/707

(21) International Application Number: PCT/IL00/00635

(22) International Filing Date: 10 October 2000 (10.10.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/415,723 12 October 1999 (12.10.1999) US

(71) Applicant *(for all designated States except US)*: **ITRAN COMMUNICATIONS LTD.** [IL/IL]; 9 Yehoshua Hatzoref St., P.O. Box 844, 84106 Beer Sheva (IL).

(72) Inventors; and
(75) Inventors/Applicants *(for US only)*: **RAPHAELI, Dan** [IL/IL]; Halamed Hei Street 19, 44394 Kfar Saba (IL). **MATMOR, Avner** [IL/IL]; 11 Haela St., 84965 Omer (IL).

(74) Agent: ZARETSKY, Howard; P.O. Box 12735, 46733 Herzelia (IL).

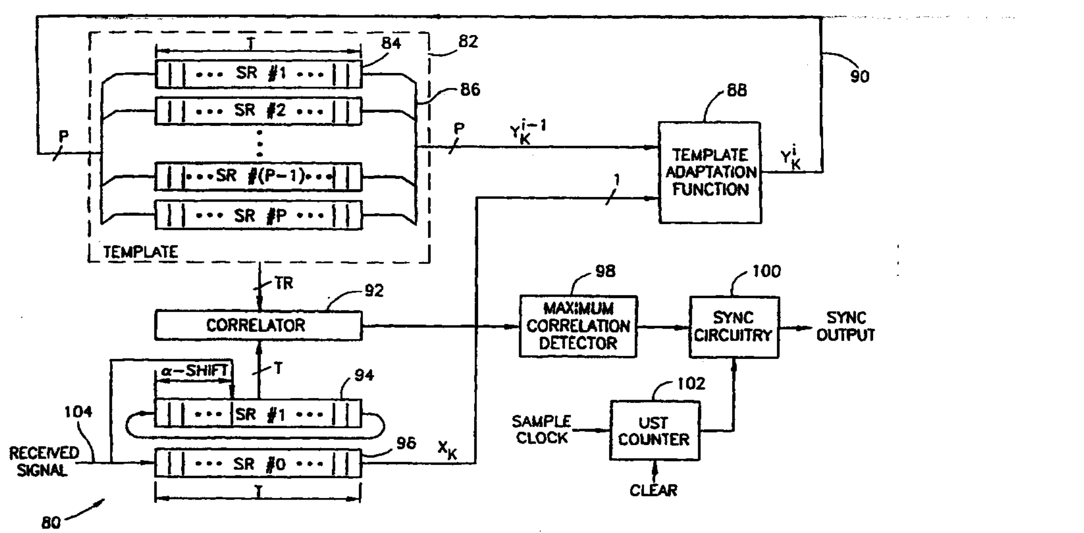
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *With international search report.*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: APPARATUS FOR AND METHOD OF ADAPTIVE SYNCHRONIZATION IN A SPREAD SPECTRUM COMMUNICATIONS RECEIVER



(57) Abstract: The present invention utilizes CSK modulation for the synchronization acquisition stage. The transmitter transmits data in the form of packets to the receiver, wherein each packet is preceded by a preamble comprising a number of symbols. The length of the preamble can be any suitable number of symbols such that the receiver is able to synchronize with the transmitter. The preamble comprises a sequence of rotated or non-rotated symbols, inverted or non-inverted (or generally phase-rotated by some amount). In some embodiments, the preamble comprises a sequence of non-rotated symbols (or symbols with a constant fixed rotation) followed by one or more symbols with a known random shift, the rotation applied to each rotated symbol being independent of the rotation applied to other symbols.

WO 01/28146 A1